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ABSTRACT

Accepting the idea of food as a basic social right, the author examines how a global right to food might become a reality for the present generation of hungry people. The paper includes an analysis of the planet's physical capacity to assure food for all and suggests that development strategies will have to become more directly oriented toward meeting basic needs and creating new methods of growth. Also, third world countries will have to make major reorientations in both domestic and international relations. The links between the goals of increasing individual welfare and the desire for greater international justice are examined. The author suggests that an important step toward more equitable distribution of costs associated with meeting global food needs would be the creation of a shared foundation for dealing with the issues. This foundation would study problems such as the export of agricultural commodities by multinational corporations which may deprive people of the exporting country from food. (Author/KC)

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The Right to Food: How to Guarantee

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This paper is one in a series of working papers commissioned by the World Order Models Project in its effort to stimulate research, education, dialogue, and political action which will contribute to a movement for a just world order. The papers will deal with major global problems facing humanity, and particularly vexing contemporary political, economic, social, and cultural issues within an analytic and normative framework guided by the concepts and values of peace, economic well-being, social justice, and ecological stability. Special emphasis will be given to the necessity and feasibility of structural transformation of today's fragmented world in order to resolve these problems and achieve just world order results.

A Working Group of the World Order Models Project (WOMP) will use these papers in its new program aimed at publishing a statement in 1980 outlining the strategies for realizing just world order during this century. We invite interested individuals throughout the globe to respond to the various papers either directly to the individual authors or to WOMP. These communications will figure significantly in the WOMP Working Group's final statement. Where appropriate, the responses and critiques will be published in *Alternatives: A Journal of World Policy.*

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THE RIGHT TO FOOD: HOW TO GUARANTEE

Cheryl CHRISTENSEN*

The article accepts the idea of a right to food as a socially basic right – everyone's minimum reasonable claims on the rest of humanity. It then tries to determine whether, and how, a global right to food might become a reality for the present generation of hungry people. Physical constraints to increased agricultural production, while important, are not insurmountable barriers to achieving a right to food. More fundamental are choices about the shape of development programs within countries – and their immediate beneficiaries – and the way in which international transactions distribute the costs, risks, and burdens of guaranteeing a sustainable right to food. The author argues that international changes should be made to minimize the current tendency for the greatest burdens and costs of securing a right to food to fall on individuals and collectivities with the fewest resources for changing the existing political and economic structures.

Universal advocacy of right to food

International rhetoric has repeatedly affirmed the principle that all people have a right to food. The 1948 United Nations Declaration of Universal Human Rights stated that 'Everyone has the right to a standard of living adequate for the health and well-being of himself and his family, including food, housing, and medical care.'[1] It further identified this right as one rooted in both domestic and international structures, claiming that 'Everyone is entitled to a social and international order in which the rights and freedoms set forth in this Declaration can be fully realized'.[2]

Similarly, the 1966 International Covenant on Economic, Social and Cultural Rights recognized 'the fundamental right of everybody to be free from hunger' and urged states to take 'individually and through

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[1] United Nations, *Universal Declaration of Human Rights*, UN Document A/811, December 1948, Article 25.1.
[2] ibid., Article 28.

international cooperation' the measures required to increase food production and 'ensure an equitable distribution of world food supplies in relation to need ...'[3]

More recently, the World Food Conference declared that 'Every man, woman and child has the inalienable right to be free from hunger and malnutrition in order to develop fully and to maintain their physical and mental faculties.'[4]

These declarations, and others like them, advance the universal right to food as a normative principle – a basis upon which subsequent duties, obligations and guarantees *could* be arranged.[5] While these declarations avoid specifics, the sentiment behind them seems clear: All human beings are entitled to enough food to meet basic nutritional needs. Furthermore, the idea of a 'right' to food means, at least, that availability of food is grounded in more than the immediate expediency of assuring it, or in the charity of others. The clear implication is that the prevailing social and international order ought to be sensitive to human food needs, and ought to provide mechanisms for assuring that these needs are met.

The case for the right to food as a desirable normative principle has been made by others.[6] Indeed, it hardly seems necessary to justify the claim that hungry people have a right to eat. Adequate food is so widely accepted as a prerequisite for life, and for the enjoyment of most other economic and political rights, that it can genuinely be considered a basic social right – one of 'everyone's minimum reasonable demands upon the rest of humanity'.[7] Yet, despite its fundamental nature, a 'right to food' should not be examined in too narrow a context. Doing so can create arbitrary tradeoffs between the right to food and other basic human needs and rights. To avoid this pitfall, the 'right to food' will be examined here as one of a number of subsistence rights, which also include the right to safe drinking water, adequate clothing, and adequate shelter.[8] There are two advantages in this more comprehensive approach. First, subsistence rights have some common features which can be useful in discussing the right to food along with its larger implications. Second, a sustainable right to food may, in practice, be one element in a

[3]United Nations, *International Covenant on Economic, Social and Cultural Rights*, annex to a resolution adopted by the General Assembly on 16 December, 1966, Article 11.2.
[4]United Nations, *Report of the World Food Conference*, November 1974, pp. 1, 10, 57.
[5]Statement of Professor N.G. Onuf in Hearings Before the Subcommittee on International Resources, Food and Energy of the Committee on International Relations of the House of Representatives, *The Right to Food Resolution* (94th Congress, Second Session); June 1976 p. 123.
[6]See Henry Shue, *Foundations for a Balanced U.S. Policy on Human Rights: The Significance of Subsistence Rights*, Working Paper HRFP-1 (Maryland: Center for Philosophy and Public Policy, University of Maryland, November 1977), pp. 1–16.
[7]Ibid., p. 3.
[8]As defined in Shue (f.n. 6) p. 10.

'package' of subsistence rights which provide minimal economic security.

If the 'right to food' is to have any practical meaning, it must be realizable and sustainable. The central purpose of this paper is to examine whether and how a global right to food might become a reality for the present generation of hungry people, and how such a right could be firmly guaranteed for future generations. The problems in getting the contemporary global food sytem to eradicate hunger are so severe, and the structural roots of hunger go so deep, that fundamental changes in both national and international patterns will be required if a sustainable end to hunger is to be achieved in any reasonable period of time.[9] Yet, it is not clear in what arenas changes should be pushed, or even how strategies of change should be formulated. What means for realizing a global right to food are promising? What mix of local, national and global action would be required to utilize them? Because of these uncertainties, a substantial part of this paper will be devoted to assembling evidence about the 'right-to-food' potential of various policies which have been suggested.

This paper, then, includes, but is not limited to, an analysis of the planet's physical capacity to assure food to all. It also examines the relationship between the right to food and the wider development strategies. Here some particularly difficult issues must be faced. The analysis presented here suggests that national development strategies will have to become much more directly oriented toward meeting basic human needs, creating new engines of growth, if most of the world's hungry people are to enjoy a sustainable right to food. This conclusion implies major reorientations in both domestic and international relations for most poor Third World countries. Yet, when it comes to feeding the hungry, the greatest burden of change may fall precisely on those countries which have the fewest resources for bringing about such a change. In addition, if selective 'dissociation' from international transactions is attempted, it may create windfall gains for countries and classes whose economic position is relatively strong. While this strategy might be effective in guaranteeing that the hungry can eat, it would have little or no effect on the radical inequality that characterizes the existing global food structure. Therefore, after explaining why the right to food should be embedded in a wider basic-needs development strategy, the paper will explicitly consider both the links between the goal of increasing individual welfare and the desire for greater international justice. Some 'subsistence duties', which might be required for international actors in the global food system, will be identified as one way of promoting both welfare and justice.

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[9]For an analysis of these structural problems, see Cheryl Christensen, 'A Structural Approach to World Hunger', forthcoming in *International Organization*, Summer, 1978.

Dimensions of present hunger

When discussing policies to eliminate hunger, it is necessary to have at least a rough indication of the task at hand. About 1·3 billion people in the developing market economies of Asia, Africa, Latin America and the Near East – about *two-thirds* of the total population – suffer from undernutrition or, more bluntly, hunger.[10] They do not get enough food to meet the minimal daily calorie requirements for the region in which they live.[11] Furthermore, some 985 million people, about 40% of the total population of the developing market economies, are seriously malnourished. Their calorie consumption falls below minimal nutritional requirements by 250 calories or more a day. By and large, the hungry members of these societies are the poor; their incomes are too low to procure enough to eat.[12]

The severity of the problem varies from region to region. In Asia, some 924 million people, i.e. over 80% of the population, are undernourished. To put it differently, almost three–fourths of all the world's hungry people live in Asia. In Africa, about 193 million people, i.e. over 60% of that region's population, are inadequately nourished. In Latin America, 112 million people, comprising 36% of the regional population, are inadequately fed. In the Near East, 61 million people, or about one–third of the population, are undernourished.

To eliminate this hunger directly would require substantial, though not unattainable, quantities of food. If grain were delivered directly to the hungry, and only to them, about 35·6 million metric tons would be enough to eliminate hunger.[13] This is less than 3% of the world's 1974 grain production, but more than 9% of the total grain production of the LDCs.

In terms of the physical quantity of available food, the world could insure a universal right to food today. If the world's present food supplies were distributed in an egalitarian way, each person could receive over 3000 calories a day – 2568 from vegetable sources and 447 from livestock products.[14] This is higher than the 'minimal nutritional requirements' for any region of the world. However, at the national level, the story is quite

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[10]Shlomo Reutlinger and Marcelo Selowsky, *Malnutrition and Poverty: Magnitude and Policy Options*, World Bank Staff Occasional Paper No. 23 (Baltimore: Johns Hopkins, 1976), p. 27. This estimate explicitly takes into account hunger rooted in the income distributions within developing regions, and, hence, is higher than the previous estimates based on national, per capita statistics. The latter figures essentially assume an equal distribution of national food supplies, a clear underestimation of hunger when supplies are very unevenly distributed.

[11]These minimal daily calorie requirements are: Latin America, 2390; Asia, 2210; Middle East, 2450 and Africa, 2350, ibid, p. 13.

[12]ibid., pp. 19–29, from which subsequent data on regional hunger are drawn.

[13]ibid.

[14]FAO, *Production Yearbook, 1976* (Rome: Food and Agriculture Organization, 1977), p. 243.

different. In many countries, the aggregate domestic supply of food is simply too small to meet the minimal needs of the entire population, even assuming an egalitarian distribution. In 1972–1974, this was the case for 57 developing market economies, which contained almost half the global population. In other words, these countries (listed in Table 1 below) would have to increase their aggregate domestic food supply in order to free all citizens from hunger. Most OPEC countries have dramatically increased their food imports since 1973, and have the necessary foreign exchange for continued purchases. For the remaining countries, however, the increase, if any, must come from some combination of increased domestic production, commercial imports, and/or concessional transfers.

Table 1
Per cent of minimal daily calorie requirements consumed
(Per capita, 1972–1974)

Africa					
Algeria	83	Lesotho	97	Somalia	83
Angola	85	Liberia	86	Swaziland	91
Benin	89	Mali	75	Tanzania	84
Botswana	87	Mauritania	81	Togo	94
Chad	74	Mozambique	85	Tunisia	99
Ethiopia	88	Niger	79	Uganda	92
Gabon	97	Nigeria	88	Upper Volta	73
Gambia	97	Rwanda	91	Zaire	83
Guinea	86	Senegal	92	Zambia	87
Kenya	92	Sierra Leone	98		
Asia					
Bangladesh	84	India	89	Pakistan	92
Bhutan	90	Indonesia	94	Philippines	86
Burma	99	Lao People's Dem. Republic	93	Sri Lanka	94
Dem. Kampuchea	94	Nepal	92		
Latin America					
Bolivia	78	El Salvador	82	Peru	99
Colombia	97	Guatemala	91	Venezuela	97
Dominican Rep.	95	Haiti	90		
Ecuador	91	Honduras	91		
Near East					
Afganistan	82	Jordan	90	Yemen People's Dem. Rep.	85
Iran	96	Sudan	88		
Iraq	99	Yemen Arab Rep.	83		

Source: FAO, *The State of Food and Agriculture, 1976* (Rome, 1977), pp. 154–155.

There is empirical evidence that hunger cannot be attributed to a present physical scarcity of food *at the global level.* This fact is especially clear now,

when major grain–exporting countries are battling a 'surplus' and are enacting acreage controls to stem falling prices. Yet, the same conclusion cannot automatically be drawn for many developing market economies. For some of them, existing national food supplies are too small to support a right to food, and attention must therefore be given both to increasing food production and to improving food distribution. Increased food production must *at least* keep pace with population increases, and, if a right to food is to be implemented nationally in developing market economies, production must rise far enough above population growth to permit increases in food consumption. Furthermore, if global food distribution patterns are not substantially changed, increased food production *which specifically benefits the hungry* may be the only way to a sustainable right to food in a viable development program.

The planetary capacity to feed the world's people

The strongest objection to a global right to food is rooted in the contention that it is physically impossible to produce enough food to adequately feed the growing world population. It is not easy, nor even useful, to draw too sharp a line between the 'physical' constraints on food production, and the economic and political conditions under which food production is organized. Yet, this section of the paper will try to deal primarily with the issue of whether or not there is a physical infrastructure which can support a global right to food. The following two sections will deal more directly with the implications of using different policy instruments within diverse systems of organizing food production to attempt to eliminate hunger on a global scale.

Projections of present global population growth rates suggest that global population in A.D. 2010 will be about twice its 1975 level – or about 8 billion people.[15] The bulk of the growth in population will occur in the developing countries, where hunger is already so widespread. Even if the global population growth rate begins to decline, as recent evidence suggests that it is doing, the total world population will increase substantially in the next generation anyway. Thus, even if the present global food supplies were distributed in an entirely egalitarian way, the world food supply would need to double over the next 35 years to *sustain* the distributional benefits.

The task of doubling the global food production over a generation is not as

[15]This assumes that growth follows the UN's 'medium scenario'. Cf. J. de Hoogh *et al.*, 'Food for a Growing World Population: Some of the Main Findings of the Long Term Prospects of the World Food Situation', *European Review of Agricultural Economics* 3, 4, 1977, pp. 459–499.

unrealistic as it may sound at first. In fact, this is roughly what has occurred since World War II. However, there are several reasons to doubt that past production patterns can be easily extrapolated into the future.[16] First, much of the increase in aggregate production outside Europe and North America was achieved by bringing new agricultural land under cultivation. Now, it is argued, unused land suitable for agriculture is far more scarce. Second, the increases in yield which occurred in advanced industrial states rested in large part on heavy inputs of cheap energy. This resource may never be available to poor countries faced with higher international energy prices and dwindling petroleum supplies. Third, by bringing ever more land under cultivation and relying heavily on yield–increasing inputs, we may inadvertently cause environmental damage which could seriously *limit* food production in the long run (not to mention the possibility of impairing other aspects of human life as well). Whether or not such situations emerge depends critically on how fixed resources (such as land, water, and nonrenewable energy stocks) are used, and how renewable biological resources are managed.

Despite the fact that real problems exist, there is nothing inherent in the present physical resource endowment which makes a sustainable right to food in principle impossible. At the global level, there are substantial reserves of potentially arable land. Less than half the globe's 3·2 billion acres of potentially arable land is presently cultivated.[17] As Table 2 below shows, there are substantial reserves of agricultural land not only in North America, and Australia, but particularly in the Third World. Indeed, 72% of the world agricultural land reserve is in developing countries. Unfortunately, however, the most abundant reserves of cultivable land are not always located near the largest numbers of hungry people. Asia, with almost three–fourths of the world's malnourished people, has only 6% reserve agricultural land. Clearly, if a right to food is to be regionally or nationally based, Asian countries *must* increase the yields of their basic food crops.[18] Latin America and Africa, on the other hand, have large land reserves which could permit increased cultivation.

While there are substantial reserves of land in Third World countries,

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[16]For a summary of these problems, see Lester Brown, *By Bread Alone* (New York: Praeger, 1974).

[17]Several studies converge on this estimate. See, for example, FAO, *Provisional Indicative World Plan for Agricultural Development* (Rome: FAO, 1969); U.S. Government, *A Report of the President's Science Advisory Committee* (Washington D.C.: The White House, 1967), volume II; and the more recent H. Linnemann and M.A. Keyzer (eds.) *MOIRA – A Model of International Relations in Agriculture* (Amsterdam, in press), whose conclusions are reviewed in P. Buringh, 'Food Production Potential of the World', *World Development 5*, 5–7, 1977, pp. 477–485.

[18]For a convergent finding, based on a basic needs oriented simulation, see Amilcar Herrera *et al.*, *Catastrophe or New Society? A Latin American World Model* (Ottawa: International Development Research Centre, 1976).

Table 2
Available and cultivated land by continents
(in million hectares)

Continent	Potential usable land	Cultivated land	Cultivated as % of arable
Africa	734	158	22
Asia	627	519	83
Australia and New Zealand	153	32	21
Europe	174	154	88
North America	465	239	51
South America	681	77	11
USSR	356	227	64
TOTAL	3190	1406	44

Source: Based on data presented in *The World Food Problem, A Report of the President's Science Advisory Committee*, Vol. II, p. 434, as summarized in P. Buringh, 'Food Production Potential of the World', *World Development*, 515–7, 1977, p. 479.

their agricultural utility cannot be taken for granted. Some authors, including Mesarovic and Pestel, have discounted tropical land because they believe the laterite content of the soil keeps it from being agriculturally productive on a sustainable basis.[19] However, more recent studies indicate that the laterite problem has been overestimated and that it affects only about 7% of tropical soils.[20] Hence, it makes sense to see tropical lands as potential sources of greater food production. However, some important problems remain to be recognized and overcome.

First, while all soils lose fertility if cultivated continuously without fertilization, a large share of the land in Africa and Latin America is composed of soils (oxisols) which lose fertility very rapidly if a vegetative cover is not maintained.[21] The traditional response to this problem was a shifting agricultural pattern: a few years of cultivation, followed by several years of noncultivation to permit natural regeneration. If these soils are to be permanently cultivated, great care must be taken to maintain their fertility. Other key soils (alfisols, utisols) are low in natural fertility, and therefore they require inputs to give sustainable high yields. Second, very large portions of Africa

[19]M. Mesarovic and E. Pestel, *Mankind at the Turning Point: The Second Report to the Club of Rome* (New York: E.P. Dutton, 1974), 167–170.
[20]Cf. P.A. Sanches and S.W. Buol, 'Soils of the Tropics and the World Food Crisis', *Science 188*, 1975, pp. 598–603.
[21]Louis Thompson and Frederick Troeh, *Soils and Soil Fertility* (New York: McGraw Hill, 1973), pp. 387–388.

are covered with aridisols, i.e. arid region soils which can support only limited grazing and small grain production at low yields unless irrigation is available. Almost any crop suited to the temperature can produce high yields with proper irrigation.[22] Inadequate water is one major factor which limits much African production at present.[23] Third, many tropical soils show a strong tendency toward leaching, which means that nutrients (including fertilizer) are easily lost. Particular care is therefore required in adding these nutrients, both to attain their maximum benefits and to limit environmental damage.

According to several recent estimates of potential food production, purely natural constraints on production need not harshly limit global food output if presently unused arable lands were brought into production with contemporary technical knowledge. The Linneman group estimates that 30 billion metric tons of grain – over *20 times* the global cereal production in 1976[24] – could be produced annually, assuming that potentially arable land was cultivated, that 65% of all cultivated land was used for cereal production as at present, and that all circumstances subject to human influence were optimal (e.g. perfect water management, soil utilization, fertilization, pest control, environmental protection). Similarly, recent attempts to calculate American productive capacity – using all potentially arable land with existing technology – also find the limits imposed by nature real but not prohibitive. Taking the existing yields (adjusted to take account of the fertility of different classes of land), the USA could produce the equivalent of about 1·4 billion metric tons of corn.[25] This is roughly equal to the present global grain production.

Clearly, such projections are not *predictions* of what global agricultural production will be , nor of the size of the 'supportable' global population. Nevertheless, they are useful in tempering overly pessimistic assumptions about finite stocks of agricultural land. The point is simply that the task of doubling world food production to feed a population of 8 billion people is not rendered physically impossible by a shortage of cultivable land.

A more difficult question, however, is whether new land can be brought under farming, and yields significantly increased, in the face of higher energy prices and vanishing petroleum reserves. These energy issues are particularly important, since increased yields in North America and Europe have come in large part from energy–related inputs (fertilizers, pesticides,

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[22]ibid.
[23]C.C. Webster and P.N. Wilson, *Agriculture in the Tropics* (London: Longmans, 1966), pp. 1–27.
[24]Buringh (f.n. 17), p. 482.
[25]Chung J. Yeh, Luther W. Tweeten and C. Leroy Quance, 'U.S. Agricultural Production Capacity', *American Journal of Agricultural Economics*, February, 1977, pp. 37–38.

mechanization, irrigation). Table 3 below highlights the role energy plays in modern Western agriculture.

Table 3
Commercial energy use and cereal output (1972–1973)

	Output/ha (metric ton)	Energy/ha (× 109 joules)	Energy/ ton
North America	3·5	20·2	5·8
Western Europe	3·2	27·9	8·7
Oceania	1·0	10·8	10·8
Eastern Europe and USSR	1·7	9·3	5·5
Africa	0·8	0·8	1·0
Latin America	1·4	4·2	3·0
Far East	1·3	1·7	1·3
Near East	1·3	3·8	2·9
Asia Centrally Planned	1·8	2·4	1·3
Total Developed	2·4	17·3	7·2
Total Developing	1·9	2·2	1·1

Source: FAO, *State of Food and Agriculture, 1976* (Rome: FAO, 1977), p. 94.

While agricultural production accounts for only a small portion of the total commercial energy use in the developed countries (about 3;4%), that amount of energy is almost five times greater than all commercial energy used for agriculture in the developing countries.[26] Hence, reproducing this pattern of energy use in Third World countries would involve massive increases in energy consumption – at the cost of severely straining their foreign exchange capabilities.[27] However, it is not clear that trying to reproduce the energy use pattern of Western agriculture would make sense even *if* the immediate foreign exchange problem could somehow be solved. The economics of agriculture has changed. During the 1960s, one dollar worth of petroleum bought the energy equivalent of 3800 hours of human labor; now it buys the equivalent of 476 hours.[28] The rising cost and dwindling supply of nonrenewable energy stocks now make it imperative to economize on the use of fossil fuel, and to develop alternative energy sources as well as different patterns of energy use altogether.

To decide whether such a shift is possible in practice, it may be helpful to understand the ways in which fossil fuels are used in agriculture. Table 4

[26]FAO, *The State of Food and Agriculture, 1976* (Rome: FAO, 1977), p. 95.
[27]This has already happened in the case of many developing countries. See FAO (f.n. 26), pp. 20–24, 109.
[28]FAO (f.n. 26), p. 81.

indicates the respective percentages of commercial energy used in agriculture which are currently allocated for fertilizer manufacture, farm machinery, irrigation and pesticides in various parts of the world.

Table 4

Commercial energy use in agriculture (% by input)
(1972–1973)

Region	Fertilizer %	Farm machinery %	Irrigation %	Pesticides %
North America	35·0	60·7	1·7	2·6
Western Europe	34·2	63·3	0·7	1·7
Oceania	25·5	73·0	0·9	2·3
Eastern Europe and USSR	51·6	45·2	0·9	2·3
Africa	54·3	42·9	1·7	1·7
Latin America	48·9	47·3	1·9	1·7
Far East	83·5	7·8	8·2	0·4
Near East	51·2	29·8	18·3	0·8
Asia Centrally Planned	76·4	9·6	8·5	5·6

Source: FAO, *The State of Food and Agriculture, 1976* (Rome: FAO, 1977), p. 97.

In most developing regions, fertilizer is the most important energy–intensive agricultural input. However, in terms of global fertilizer consumption, these regions use relatively little commercial fertilizer, as can be seen from Table 5.

Table 5

Commercial fertilizer use

Region	Kilograms of fertilizer per hectare of arable land (permanent crops, 1975)
North America	79·6
Western Europe	185·2
Oceania	26·1
Eastern Europe and USSR	96·0
Africa	5·6
Latin America	31·9
Near East	24·7
Far East	21·2
Asia Centrally Planned	49·7

Source: FAO, *Annual Fertilizer Review, 1976* (Rome: FAO, 1977), pp. 19–20.

Heavier reliance on methods to improve agricultural fertility will certainly be necessary if the right to food is to be implemented regionally or nationally in Asia. Over and above its contribution to increasing the yield of a single crop, fertilization is necessary to permit multiple cropping.[29] Furthermore, bringing a large part of potentially arable tropical land into continuous cultivation will require special measures to ensure continued soil fertility.

Fortunately, there are several ways to enhance soil fertility and preserve soil during continuous cultivation which do not rest solely on a heavy application of commercial fertilizer. First, attempts can be made to improve fallow: rather than simply leaving land to regenerate itself naturally, grass and legumes may be planted. In tropical areas, pigeon peas and weedy cassava have the potential of being used as 'fallow crops'.[30] Although such practices may produce only marginal improvements in soil fertility, they have the secondary benefit of providing farmers with additional food. Second, crop rotation and mixed cropping can be practiced. Since different crops require nutrients in varying proportions, such practices can limit the drain on soil fertility sometimes associated with monoculture. However, soil fertility cannot be maintained by rotation alone.[31] Neither can mixed cropping maintain fertility. Rotation and mixed cropping can, however, slow down fertility decline, and can sometimes also result in higher yields per hectare (although lower yields for individual crops).[32] Third, green manure crops may be planted in rotation. However, this practice is viable only where there is enough moisture to promote *both* the vigorous growth and the decomposition of green manure crop, during the period between ploughing and planting the next crop.[33] Such methods are therefore ineffective in dry areas. Even in congenial climates, the effects of green manuring are relatively short-lived, with fertility improvements rarely extending beyond the first year.[34] All the three methods discussed above can make marginal improvements in soil fertility, but are inadequate by themselves. They cannot sustain substantial increases in productivity.

Animal and human wastes may be more effectively used to increase yields. Studies within developed countries suggest that organic manuring may be an economically viable option for some farmers.[35] More general

[29]Multiple cropping is becoming a more important source of increased food production. For a review, see Dana Dalrymple, *Survey of Multiple Cropping in Less Developed Nations* (Washington D.C.: USDA/ERS, 1971).

[30]Webster and Wilson (f.n. 23), p. 179.

[31]ibid., p. 182.

[32]ibid., p. 183.

[33]ibid., pp. 184–188.

[34]ibid.

[35]Cf., for example, G.M. Benardi, 'An Energy and Economic Analysis of Conventional and Organic Wheat Farming' in Raymond C. Loehr (ed), *Food, Fertilizer and Agricultural Residues* (Ann Arbor, Michigan: Ann Arbor Science Publishers, 1977), pp. 439–448.

opportunities for supplementing commercial fertilizer use also exist. Available supplies of livestock and municipal waste in the United States are large enough to provide a substantial share of present fertilizer consumption.[36] The roughly 180 million tons of dried sewage sludge and animal manures could provide as much as 17% of the nitrogen, 18% of the phosphorous, and 34% of the potash now applied to arable American soils.[37] In developing countries, the potential gains are even larger. Rough estimates indicate that plant, human and animal wastes could provide almost eight times the nutrients now supplied by commercial fertilizers.[38] Experiments indicate that a majority of crops tested respond well to organic fertilizers in tropical conditions, and that such applications sometimes create relatively long-lasting residual effects superior to those of commercial fertilizers.[39]

Organic fertilizer is not a panacea, however. First, a substantial portion of its nutrients are lost when it is dried, and even more are lost if it is not worked into the soil when applied.[40] Where wheeled transport for hauling is scarce, the logistics of moving and applying large quantities of organic manure are not trivial. Second, in some parts of the world, dung may be used for fuel. Burning destroys its nutrients, however, and makes the residual product unusable as fertilizer. On the other hand, biogas technology, which generates methane gas from animal wastes without destroying their nutrients, is a promising way to provide both fuel and fertilizer from local resources.[41] Third, the availability of large quantities of organic manure depends on having livestock. In some parts of Africa, tsetse fly effectively prevents the keeping of livestock, and hence the possibilities for organic manuring are low. In other areas, agriculture and the raising of livestock are not integrated, and animal wastes are thus deposited too far from cultivation sites to be useful as fertilizer. Even where cultivation and livestock are mixed, it is not always clear that sustaining or increasing the number of animals is an efficient use of the region's resources.[42]

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[36]Note that wastes in the United States often contain heavy metals and concentrations of minerals accumulated from supplements fed to livestock, which make it less useful for fertilizer. See R. White-Stevens, 'Perspectives on Fertilizer Use, Residue Utilization and Food Production' in Loehr (f.n. 35), pp. 12–13.

[37]ibid., p. 13.

[38]J.J.C. van Voorhoeve, *Organic Fertilizers: Problems and Potential for Developing Countries* (Washington D.C.: World Bank, 1974), as cited in FAO (f.n. 26), pp. 99–100.

[39]Webster and Wilson (f.n. 23), pp. 188–192.

[40]White-Stevens (f.n. 36), p. 13.

[41]For discussions of biogas technology, see L. van den Berg and C.P. Lentz, 'Methane Production During Treatment of Food Plant Wastes by Anaerobic Digestion', in Loehr (f.n. 35), pp. 381–397; G.R. Morris, W.J. Jewell and R.C. Loehr, 'Anaerobic Fermentation of Animal Wastes: Design and Operational Criteria' in Loehr, pp. 397–414; and Arjun Makhijani, *Energy and Agriculture in the Third World* (Cambridge, Mass: Ballinger, 1975), pp. 101–123.

[42]Where livestock put a strain on grazing land and create environmental damage, or when they compete with people for limited food production, expansion will be undesirable.

Agricultural crop residues, which contain about a quarter of the solar energy captured during crop production, can also be used as fertilizer and fuel.[43] Using this resource to fertilize fields by creating compost is a common practice in India and China, although less so elsewhere.[44] However, adequate water is needed both for composting and for permitting the disintegration of directly buried residues. Since the volume of crop wastes required to provide nutrients is large, transportation requirements again impose a constraint.

Could a combination of livestock wastes and compost make a significant contribution to crop yields? From what has been said, much depends on the locality. However, there appears to be a real potential for yield improvement. Assuming that cattle produce about 3 tons of manure a year, and that a small farm yields about 15 tons of compost, a small farmer with two heads of cattle could produce the equivalent of 225 kilograms of nitrogen fertilizer, or about 90 kilograms of nitrogen per hectare.[45]

The first 15–30 kilograms of nitrogen applied per hectare brings an increase of 10–15 kilograms of grain per kilogram of nitrogen, with diminishing increments thereafter. Hence, a small farmer could reap the most dramatic gains associated with fertilization through the use of local resources. Pushing for maximum yields, on the other hand, would require either a larger pool of cattle, or partial reliance on commercial fertilizer.

The careful use of crop residues and animal wastes can support significant increases in agricultural productivity even on a large scale, as the Chinese experience indicates. Where local organic manures are used for routine soil preparation and for crops which require moderate applications of fertilizer, more costly chemical fertilizers can be used sparingly to meet special nutrient needs. Between 1952 and 1966, China increased its application of organic fertilizers from 728 to 1063 million metric tons, while the application of chemical fertilizers increased from 318 to 13905 thousand tons.[46] This combined use of organic and chemical fertilizers (98% organic even in 1966) permitted the area planted with higher-yielding food grains to increase from 5·3 to over 94 million hectares, and the area planted with high-yielding staple crops to expand from 4·7 to 78 million hectares.[47] Clearly, a heavily organic fertilizer program, selectively supplemented with chemical fertilizers, was able to support a shift to improved crop varieties and higher productivity. Attention to better water control and expanded

[43]FAO (f.n. 26), p. 107.
[44]For a comparison of these two countries, see Kalyani Bandyopadhyaya, *Agricultural Development in China and India: A Comparative Study* (New York: John Wiley, 1976).
[45]Computed from data provided in Webster and Wilson (f.n. 23), pp. 188, 192.
[46]Bandyopadhyaya (f.n. 44), p. 167.
[47]ibid., p. 170.

local irrigation helped to enhance the effectiveness of local fertilizers and to increase the practice of multiple cropping.[48]

It seems unnecessarily pessimistic to assume that increases in agricultural productivity automatically require heavy inputs of energy–intensive fertilizer associated with Western–style agriculture. Given the low yields in many developing countries, significant gains could be made with much less of energy–intensive fertilizer mix, for the marginal productivity of fertilizer is high. Furthermore, in areas where climate permits multiple cropping, organic fertilizer (which can maintain soil fertility and increase the humus content) could greatly increase production even if crop yields did not rise as dramatically as those associated with the fertilizer–intensive high–yielding varieties. It may be, as FAO has suggested, that the cheap energy of the 1950s and 1960s encouraged developing countries to shift from relatively traditional agriculture to more energy–intensive models, bypassing a viable intermediate system.[49]

Mechanization represents another source of energy use in agriculture, but the heavy emphasis on mechanization, which has characterized Western agricultural development, seems far less necessary and appropriate in developing countries. In the first place, full–scale mechanization of agriculture along Western lines would substitute expensive energy for human labor, at a time when neither the cities nor urban industries can productively absorb migrants from the countryside.[50] Moreover, the farm machinery used in many Western countries (particularly the United States) is much larger than that required in Third World settings. Deep cultivation, for example, has been instituted in China with much smaller tractors and less elaborate equipment.[51] The same is true of the machinery needed to permit speedy tilling, where weather patterns or the desire to multiple crop makes this imperative. US tractors weigh 15 tons on the average, which means a heavy energy input in the construction of the machine, and annual fuel requirements of 4–5 tons of gasoline.[52] By contrast, the tractors presently used in developing countries are about half this weight, and have fuel requirements of only about 3 tons per year.[53] 'Intermediate' machinery consciously designed to economize on fuel could push energy requirements for selective mechanization even lower.

Some concern has been expressed that the ecological consequences of

[48] ibid., pp. 162–173.
[49] FAO (f.n. 26), p. 99.
[50] For the difficulties of underemployment and developmental programs to respond to them, see ILO, *Employment Growth and Basic Needs: A One World Problem* (New York: Praeger, 1977).
[51] Bandyopadhyaya (f.n. 44), pp. 171–173.
[52] FAO (f.n. 26), pp. 100–101.
[53] ibid., p. 101.

increased agricultural production would impose serious physical limits on food production. This possibility certainly exists in view of the combined effects of growing populations and social structures which push greater numbers of poor subsistence farmers onto marginal land.[54] Ecological damage, which stems from the individual attempts of poor cultivators to survive in the short run by destroying the basis of future survival, is unlikely to be halted unless dramatic changes in social and economic structures occur.

However, more intense cultivation need not undermine ecological stability. Many of the problems associated with increased fertilizer use, such as the leaching and pollution of ground water, can be avoided by more careful application. Smaller, more frequent applications of fertilizer (organic or chemical) will both limit runoff and reduce the total quantity required for increased productivity.[55] Many of the negative side effects of increased irrigation can be avoided, or at least reduced, by improving water distribution channels, using less water-intensive irrigation methods and providing better drainage.[56] Unintended effects on the water table can be reduced by collective action to phase water applications, and coordinate the spacing of irrigation facilities.[57] Better water control systems, which capture and store water during periods of heavy rainfall, can both reduce damage from flooding and provide more steady water supplies.[58] The effects of pesticides can be tempered by substituting systems of 'integrated pest management' based on more natural means of controlling insects.[59] Where pesticides are used, their quantity can be reduced by 'early warning systems' (as diverse as the 'barefoot doctors of agriculture' in China, and the telephone alert systems in America) which enable pesticides to be applied only when there is evidence that they are actually needed.[60]

Admittedly, then, there are some physical constraints upon agricultural production. However, even without banking on nitrogen-fixation or dramatic breakthroughs in dry-land agriculture or high-yielding staples, a right-to-food strategy based on higher food production can be implemented

[54] For a discussion of the dangers, see Frik Eckholm, *Losing Ground* (New York: W.W. Norton, 1976).
[55] White-Stevens (f.n. 36), pp. 9–10.
[56] For a discussion of alternative methods and application procedures, see B. Yaron, E. Panfors and Y. Vaadia, *Arid Zone Irrigation* (New York: Springer-Verlag, 1973), pp. 303–424.
[57] See Edward J. Clay, 'Equity and Productivity Effects of a Package of Technical Innovations and Changes in Social Institutions: Tubewells, Tractors and High Yielding Varieties', *Indian Journal of Agricultural Economics XXX*, 4, October 1975, pp. 74–87.
[58] Webster and Wilson (f.n. 23), pp. 108–115.
[59] 'Integrated pest management' refers to a combination of biological methods of insect control, pesticide application, and sometimes combination planting to reduce insect infestation.
[60] The American system involves a local 'hot line' number which farmers can call to discover if an insect against which pesticides might be used is actually in the area. The service reduces the number of automatic, precautionary applications of pesticides a farmer will make.

within these limits.[61] This does not mean, of course, that we will *necessarily* see food production rise high enough to guarantee a universal right to food. The economic and political structures within which production is stimulated, and within which food resources are distributed, may make that desirable and feasible outcome less likely.

The global food system and the right to food

Even when physical resources to support greater agricultural production exist, additional supplies may be forthcoming only at substantially higher prices. In a market environment characterized by great inequality in purchasing power and productive assets, hunger may persist or even grow as food supplies increase.[62] The present global food system represents such a market environment. A recent attempt to project future hunger patterns within the *existing* global food structure using the MOIRA model highlights the implications of fundamental inequality for the goal of realizing the universal right to food.[63] It finds that if present patterns of income distribution within and among countries go unchanged, and growth in industrial and agricultural sectors follows past trends, the market response to a 'medium' rate of population growth will not promote a universal right to food. Over the 35 years from 1975 to 2010, world food prices would fluctuate from 2·5 to 4 times their 1965 level. Aggregate global food production would grow by about 2·5% a year (outpacing population growth), but the number of hungry people would *quadruple* because the new food supplies would be used primarily to improve the diets of adequately fed people with rising incomes.[64]

It has been argued that fluctuating food prices, coupled with uncertainty over the urgency and profitability of major investments in agriculture, are major problems. To stimulate production, enough to cover both increases in demand and population growth over the long run, *stable*, *high* world food prices would be needed. Only persistently high food prices would stimulate investments needed to develop potentially arable land by clearing, draining and irrigating it. Similarly, only sustained higher prices could provide sufficient incentives to make maximum use of existing resources, and thus promote investment in facilities to produce key agricultural inputs. Because

[61] For a discussion of these possibilities, see Roger Revelle, 'The Resources Available for Agriculture', *Scientific American*, September, 1976, pp. 170–174.
[62] See Christensen (f.n. 9), for a more detailed explanation.
[63] See J. de Hoogh (f.n. 15).
[64] Christensen (f.n. 9), Table 1.

many agricultural investments require long lead-times, they cannot be 'quick fixes' in times of shortage. Yet, because they are expensive, they are likely to be curtailed when prices fall. The decline in food prices from the 1972–1974 levels, for example, has already eroded commitments to build new fertilizer plants.[65] In other words, if food production is to grow enough over the long run, not only to upgrade diets, but also to meet the needs associated with population growth, high and stable prices may be needed now.

The MOIRA model was used to test the likely effects of such a policy on hunger in the present global food structure. The results suggest that high and stable prices would indeed promote substantial increases in aggregate food supplies between now and A.D. 2010, and that hunger would not increase as much as it would in a situation where prices fluctuated. However, the analysts conclude that while this policy can stem the growth of hunger,

> . . . there is no chance of its being eliminated. This is due to the contradictory influences which the price level has on the purchasing power in the poor countries of the urban population on the one hand, and the rural population on the other. High prices favor farmers (and therefore their consumption) but operate to the disadvantage of non-agricultural consumers and vice versa.[66]

The implication of this and other analyses is that the right-to-food policies, designed to operate within the parameters of the present global food system, cannot rest on the manipulation of a single policy instrument, in this case global food pricing. Even leaving aside the effect that price changes may have on the ability of marginal farmers to retain their assets, price manipulation is an inadequate policy instrument. A right-to-food policy must both stimulate food production and assure an adequate distribution of basic foodstuffs to poor cultivators and laborers. Higher food prices cannot assure an adequate distribution of food to landless rural laborers, and generally work against employment prospects for unskilled laborers in the industrial sector. On the other hand, policies which depress prices actively hurt the rural poor, and are inefficient ways of guaranteeing that the urban poor will get enough to eat. More than adjustments in food prices is needed to assure the right to food.

This observation also bears on another proposed right-to-food policy – changing the diets of people in wealthier countries. Many people have noted the enormous quantities of grain used to support livestock-based diets in industrial countries, and have suggested that reducing the consumption of animal products might 'free up' resources to eliminate hunger elsewhere. This is physically possible, as Table 6 below indicates. The grain fed to livestock in Western countries is over *six times* the 36 million metric tons

[65]Richard Reidinger, *World Fertilizer Review and Prospects to 1980/81* (Washington D.C.: USDA/ERS, 1976), pp. 15–18.
[66]J.de Hoogh (f.n. 15), p. 487.

Table 6
Grain used for feed, 1976–1977
(million metric tons)

Western Europe	97·4
United States	124·2
Japan	12·0
Canada	14·8
Australia	2·7
TOTAL	251·1

Source: United States Department of Agriculture, Economic Research Service, Unpublished computer printout.

needed to directly eliminate global hunger. However, if the present patterns of income distribution remain unchanged, altering diets is equivalent to reducing the effective demand for grain and, in the short term, lowering its price. Hence, there would be some immediate increases in consumption by the poor. However, MOIRA results indicate that over the long run, lower food prices would curb food production in both developed and developing countries. By the year 2010, there would be more hungry people than if the market had been left undisturbed.

An alternative to manipulating prices is to redistribute food supplies to the hungry, as nutrition–oriented food aid. Assuming that such assistance could be supplied with 100% efficiency, such an effort would reduce world hunger to almost zero if enough funds were available. In the MOIRA simulation, such a program would cost about 0·6% of the world GNP per year, higher than Reutlinger and Selowsky's estimate of 0·3% because of higher food prices.[67] If the economic status of the hungry did not change, however, the program would have to be continued indefinitely. While it would not act as a disincentive to agricultural production (as many concessional sales programs appear to have done), it would erode the unsupported purchasing power of the urban poor and landless laborers. Thus, if the nutrition program were terminated after 35 years, the number of hungry people would be greater than if the policy had never existed.[68] This has several implications. First, the need for the nutrition program would grow over time, making the poor (and the governments of the countries in which they lived) progressively more dependent on the rich. Under these conditions, even with the best of intentions such a program could easily become a lever of economic or political pressure. Second, such a policy would do nothing to remove the roots of hunger – the chronic poverty which reflects

[67] J. de Hoogh (f.n. 15), p. 485; Reutlinger and Selowsky (f.n. 10), p. 25.
[68] Hoogh, pp. 485–486.

the 'marginal' position the undernourished people have within their own economic and political systems. If labor is displaced from the agricultural sector, or population growth makes it more difficult to productively employ the rural population in agriculture, and industry remains relatively capital-intensive, what is technically a right to food becomes in practice a shaky guarantee of welfare.

At least some of the problems of the developing market economies stem from their position in the international trading system. Reliance on primary products for the bulk of export earnings, coupled with unstable or low prices for these commodities plus restricted access to the markets of developed countries, are frequently cited as key development constraints. Hence, many have suggested that the right to food could be furthered by specific adjustments in the international trading system itself: opening and liberalizing international agricultural trade, dissociating from this system, and/or changing the structure itself.

Western economists have long argued that the policies many nations use to protect domestic agriculture result in an inefficient world system.[69] These critics claim that if such policies were ended, world agricultural resources would be used more rationally, and it would thus become easier to eliminate or at least reduce hunger. The MOIRA model was used to test the likely consequences of trade liberalization in basic foodstuffs. The results indicate that if all protective agricultural policies were eliminated, food production in developing countries would grow less rapidly, while North American production would rapidly increase.[70] A large share of the increase would be in response to the dismantling of the European Community's Common Agricultural Policy, which would make the United States and Canada major suppliers of European foodgrains. While there would be clear gains for North American farmers, and for consumers in Europe, there would be no reduction in the level of world hunger. On the contrary, by A.D. 2010, world hunger would be 10–15% higher than if the present policies continued. The reason seems clear: the policy would do nothing to increase the purchasing power of the poor in developing countries and would, in addition, impede their own agricultural production.

An alternative liberalization policy, more directly relevant to the agricultural trade of developing countries, would be to remove Western barriers to agricultural imports from the developing market economies. The International Food Policy Research Institute (IFPRI) estimated the impact which a total elimination of tariffs on agricultural exports from the developing

[69]See, for example, D. Gale Johnson, *World Agriculture in Disarray* (Suffolk, England: Bungay, 1973).
[70]J. de Hoogh (f.n. 15), p. 488.

market economies would have on their export earnings.[71] Five countries (Argentina, Brazil, Philippines, Mexico and Taiwan) would reap over 70% of the benefits. Another 18% of the benefits would go to six countries (India, Turkey, Malaysia, Thailand and Indonesia). Among these countries, significant benefits (defined as export earnings increases of 2% or more) go to only five countries (Argentina, Brazil, Mexico, Turkey and the Philippines). Hence, the study concludes that 'Even in the unlikely event that trade barriers are completely removed in OECD countries, the relative gains from liberalization are unfortunately quite trivial for most of the twenty–eight selected countries.'[72]

It seems clear, then, that trade liberalization in agricultural commodities can do very little to promote a general right to food. Free trade in cereals would increase trade flows among advanced industrial states and benefit consumers there. US production would also compete with production in many developing countries, possibly making prices lower for some Third World consumers, but creating income losses for the rural population with no alternative to agriculture as a source of livelihood. Removing OECD barriers to agricultural exports from the developing market economies would primarily aid those countries which are already export oriented, most of which do not currently face critical limitations on their ability to import food. The gains from liberalization, then, are not distributed in ways which contribute directly to a universal right to food.

An alternative response is for a developing nation to dissociate from global food exchange networks rather than seek greater integration with them. While many developing market economies are major importers of cereals, they are not always net food importers. The production for export of crops like coffee, tea, cocoa, sugar and bananas makes Latin America and Africa net exporters of food.[73] These products serve primarily to enhance the diets of people with adequate diets in Western industrial countries. Yet, both Africa and Latin America have many hungry people. The logic of dissociation is straightforward. If developing countries stopped supplementing the diets of the wealthy and, instead, used all of their land to produce food for their own people, they could become self–sufficient in basic foodstuffs.

How far could such a reallocation of land go toward creating self–sufficiency and sustaining a right to food? This question has two parts: First, could present food imports be eliminated by such a reorientation?

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[71] Alberto Valdes and Barbara Huddleston, *Potential of Agricultural Exports to Finance Increased Food Imports in Selected Developing Countries* (Washington D.C.: International Food Policy Research Institute, 1977).
[72] ibid., p. 47.
[73] FAO, *Trade Yearbook, 1975* (Rome: FAO, 1976), p. 3.

Second, could this strategy assume the production of the additional food needed to eliminate hunger?

Coffee, cocoa, sugar, tea, bananas, cotton, jute, sisal and natural rubber are the major agricultural exports of the developing market economies. To judge the right-to-food impact of eliminating such exports, I identified the major exporters of each commodity, the land used to produce the total crop, and the share of production exported. The last factor is important, for some countries consume a substantial portion of their production domestically. From this information, it was possible to determine the quantity of land that would be released if their exports were terminated.[74] The total new cereal production expected was calculated, based on 1976 cereal yields. The results, aggregated by region, are presented in Table 7.

Table 7

Cereal production gains from export termination
(million metric tons)

	New cereal production	Net cereal imports (1976)	Cereals needed to end undernutrition	New production as % of total self-sufficiency requirement
Asia	12·6	15·7	23·2	32
Africa	6·2	8·0	6·3	43
Latin Am.	10·3	4·1	2·9	147
Near East	0·7	10·5	1·9	6
Total	29·8	38·3	34·3	41

Sources: Computed from statistics presented in FAO *Production Yearbook, 1976*; *FAO Trade Yearbook, 1975*, data on rubber acreage from *Plantation Crops, 1973*, and quantities needed to end malnutrition from Reutlinger and Selowsky, *Malnutrition and Poverty*.

The data indicate that a right to food, based on regional self-sufficiency, could be supported by immediate dissociation *only* in Latin America. Using the dissociation strategy alone, no other region could either achieve self-sufficiency at present nutritional levels or eliminate hunger at present import levels. Expanded production on new, noncultivated land and/or increases in productivity are essential to support either greater self-sufficiency or the elimination of hunger. Additional gains might be made by redistributing consumption within developing countries, but the

[74]For each exporting country, the land devoted to export crop was multiplied by the portion of the crop exported. Land released was summed across export crops to give the total land released per country. Country data was then aggregated to the regional level, to provide for comparability with the Reutlinger and Selowsky data on undernutrition.

margin for doing this is slim or nonexistent, as Table 1 (p. 185) has already indicated. The logic of immediate dissociation is weakened by these figures, for, while export revenues would decrease dramatically, significant amounts of food would still need to be imported. The reasons vary across regions. In Asia, the quantities produced are substantial, and yields relatively good, but they are dwarfed by present import levels and unmet nutritional needs. In Africa, cereal yields are so low that reallocating land to cereals, without increasing the existing yield levels, would be simply inefficient. In the Near East, the land devoted to export crops is small in any case.

These data do not suggest that regional self-sufficiency is impossible, nor that it would be futile to adjust current land-use patterns. They do suggest, though, that the right to food based on regional self-sufficiency will require more than the reallocation of existing resources. Increased food production is a *necessary* component of any such right-to-food strategy. How such production is organized, and who benefits from it, is of necessity a key right-to-food issue.

The countries most likely to adopt an export withdrawal strategy, however, are poor, food-deficit developing countries – those with few options for generating additional revenue to support commercial purchases. What impact would a selective dissociation strategy have within these nations? The withdrawal by some, but not all, nations which produce a given export crop would have two main effects. First, it would reduce the foreign exchange available to the LDCs leaving the market. Second, it would decrease the supply of the commodity, and hence, increase its world price. If demand were relatively price-inelastic, the export earnings of the remaining producers would increase. The effects can be seen by examining three major export commodities for which relatively good data are available – coffee, cocoa and tea. Assume that all countries categorized by IFPRI as poor and food-deficit nations stopped exporting these three commodities. It is then possible to calculate the implied decrease in supply, and the associated increase in world prices from base 1976 prices.[75] The revenue gains and losses are summarized in Table 8.

'Windfall gains' to those exporters choosing to remain in the market are substantial, and exceed the losses to withdrawing exporters by over $800 million. The selective termination of exports essentially does what an effective cartel would have to do: withhold production in order to raise prices. However, a collectively coordinated strategy of withholding would generally bring some gains to all participants. In the present example, by contrast, the

[75]Elasticities of demand for the three commodities were taken from Shamsher Singh, Jos de Vries, John C.L. Halley and Patrick Yeung, *Coffee, Tea and Cocoa: Market Prospects and Lending*, World Bank Staff Occasional Paper No. 22 (Baltimore: Johns Hopkins, 1977). Production and price data for 1976 were used as a base.

poorest states would pay all the costs and get non of the export benefits.

As in the case of trade liberalization, the major benefits of selective dissociation flow to a few states, by and large not the poorest. Six states would capture about 90% of the gains, as Table 9 shows, and 23 others share 10%.

As a strategy for achieving the right to food, the selective dissociation route is plagued, not only by the feasibility questions raised earlier, but also by a concern for the 'justice' of a solution which allocates major costs to those least able to bear them, and which generates gains for the relatively advantaged.

Some of the difficulties created when individual nations *react* to the existing world agricultural trade system could be reduced by coordinating efforts to reshape that system. There have long been indications that the markets for most traditional export crops are 'oversupplied' and hence lead

Table 8
Revenue gains and losses from the selective withdrawal from export markets

	Losses to withdrawing food-deficit LDCs (million US$)	Gains to remaining exporters (million US$)
Cocoa	137·5	505·2
Coffee	741·7	1240·6
Tea	721·9	1099·5
TOTAL	1601·1	2485·3

Source: *FAO Trade Yearbook, 1976; FAO Production Yearbook, 1976;* Singh et. al., *Coffee, Tea and Cocoa: Market Prospects and Development Lending* (Baltimore: Johns Hopkins, 1977)

Table 9
Distribution of gains from export withdrawals in coffee, tea, and cocoa

	Gain (in $ million)	% of Total gain
Argentina	851·2	34·2
Brazil	527·8	21·2
Colombia	260·1	10·5
Ivory Coast	222·7	9·0
Indonesia	205·9	8·3
Dominican Republic	168·0	6·8
TOTAL top six	2235·7	90·0

Source: As for Table 8.

to persistently low prices for these commodities. The dynamics of oversupply are frequently those set in motion by countries which seek to increase their foreign exchange earnings by increasing production (a rational course for an individual nation–state). The problem, of course, is that simultaneous attempts to do this lead to downward pressure on prices for all. The result is that the aggregate earnings of all exporting nations remain relatively stagnant, or even decrease. While some individual countries may make gains at the expense of others, exporters in general find it difficult to improve their lot.

This situation could be changed by a coordinated attempt to cease expanding the production of these export crops, and even to reduce supplies. Because most traditional agricultural export crops are relatively price–inelastic, decreases in supply generally result in price increases which leave exporters in a better revenue position, as the earlier example indicated.[76] Agreements to curtail export crop production, and to devote the released land to internal food production, would have several positive results. First, such a strategy would both increase revenue and marginally decrease the need for food imports. If even a portion of new revenues were devoted to policies to increase productivity and bring new land into food production, a stronger foundation for increased self–sufficiency could be laid.

Secondly, collective agreements covering a range of export crops, rather than single commodity agreements, would both permit stronger 'packages' and reduce the costs of stabilizing prices if overproduction did occur in certain years. Countries exporting only a single commodity could be permitted smaller initial cutbacks, with larger cutbacks by other countries being offset by concessions in other commodities. Furthermore, since the price movements of many key export products are not highly correlated, the costs of stabilizing annual fluctuation across many products would be much less than trying to stabilize prices for each commodity individually.[77] Third, such a collective agreement would benefit a wider range of countries than trade liberalization, and would be likely to produce more long–term gains. Many economies earn a substantial portion of their foreign exchange from the export of agricultural commodities. Revenue gains would flow to all these countries, not only to the most competitive exporters. Furthermore, effective agreements on reducing production would generate more long–lasting gains than trade liberalization, which would almost certainly stimulate

[76]For a discussion of the potential for commodity agreements, see David McNicol, *Commodity Agreements and the New International Economic Order* (California Institute of Technology, Social Science Working Paper No. 144, November 1976).
[77]ibid., Table 4.2, p. 98.

production and put increased downward pressure on prices, eroding even the limited gains initially obtained.

The past history of commodity agreements suggests two problems which would have to be overcome. First, and traditionally most difficult, is the need to prevent 'cheating' – the attempt by individual nations to produce more to take advantage of rising prices. Preventing cheating of this sort requires not only a political commitment to the agreement, but also a legitimate, workable formula for distributing both production decreases and gains. This problem will be even greater where production and/or marketing rest in the hands of private companies. Second, where some commodities are concerned, concerted action by developing countries may be offset by the actions of other countries. For example, higher sugar prices could easily stimulate domestic production in Western countries.[78] Increases in the prices of sisal, jute and rubber could easily cause greater use of synthetic substitutes. In such cases, it would be much harder to assure revenue gains. Much would depend on the price of potential substitutes for the products involved.

Most analyses of commodity agreements have proceeded from the assumption that stabilizing prices was the primary objective.[79] Let us go even further and assume that there is initially an attempt to *increase* prices, followed by an effort to stabilize them at higher levels. A 10% decrease in the supply of most key export products would bring significant gains, as Table 10 indicates.

Table 10

Annual revenue gains from a 10% supply decrease
(million $)

Cocoa	519·3
Coffee	826·7
Tea	397·1
Cotton	1388·1
Sugar	8674·0
Jute	18·1
Sisal	35·8
Rubber	180·7
TOTAL	12 039·8

Source: Computer from David L. McNicol, *Commodity Agreements and the New International Economic Order*, Social Science Working Paper No. 144, California Institute of Technology, November 1976, Table 4.1, p. 96.

[78]Cf. Gordan Gemmill, 'An Equilibrium Analysis of U.S. Sugar Policy', *American Journal of Agricultural Economics* 59, 4, November 1977, pp. 609–618.
[79]Cf. McNicol (f.n. 76).

Assuming that neither basic weather patterns nor supply and demand elasticities were altered, prices for all commodities except rubber could be stabilized with buffer stocks whose annual costs were less than the annual gains to suppliers from stable prices.[80] Assuming that cutbacks in production came by withdrawing land, rather than by destroying crops already produced, LDCs which export agricultural commodities would gain 10% more land for local food production, and over $12 billion in revenue from such a program. While this would not lay the basis for immediate self-sufficiency or the right to food, it would ease the foreign exchange constraints on importing the inputs necessary to bring new land under production while simultaneously increasing the productivity of existing land. Unlike increases in the price of minerals or petroleum, increases in these agricultural export prices would not directly raise the costs of the inputs which LDCs might import.[81]

The extent to which such extra revenues might hasten the elimination of hunger within developing countries would depend, of course, on who received these funds and how they were used. Generally speaking, however, this analysis suggests that unless these new funds are applied directly to local nutritional needs, collective action to shape international commodity markets is far preferable to uncoordinated dissociate strategies as a means for advancing the right to food.

One final set of global concerns needs to be considered before moving to a discussion of overall development policies. The recent food crisis has drawn attention to the precarious basis for global 'food security'. Even with the best production system, variations in weather will mean smaller harvests in some years. Without adequate food stocks, it will be difficult to guarantee the right to food, especially to people with low incomes. There are, of course, 'reserves' in the dietary patterns of people in wealthier countries. But, as 1972–1974 showed, government policies in some regions prevent these reserves from being tapped, while in other regions they can be touched only at prices too high to meet the needs of the poor.[82] For the last several decades, 'global reserves' have been carried by major grain-exporting countries, primarily the United States. Generally, such 'reserves' have been the byproduct of domestic agricultural policies. The disadvantages of this system are now clear. In times of scarcity, they are under the control of private exporters or of governments in exporting countries; these actors have at best only a secondary interest in assuring that the hungry poor receive adequate

[80] Ibid., Table 4.4, p. 110.
[81] Indirect increases are possible, if higher costs of living are reflected in wage rates.
[82] The European Community maintained export controls on grains to keep domestic food prices from rising; the US diet did adjust to rising world prices, but the diet change came only with very severe price increases.

food. Similarly, in times of market surplus, the accumulation of food reserves is again dictated by the self-interests of producers and exporting countries. There is, thus, little guarantee that 'optimal' stocks will be accumulated and held. The fact that the responsibility for accumulating and storing these reserves falls primarily on consumers in developed exporting countries makes it less likely that these stocks will be adequate in the future. Not only is there growing resistance to costly domestic farm programs, but, as world population grows, the quantity of food required to provide historical levels of 'food security' will increase. American 'stocks' are now high by historical levels; yet, they are low in terms of global consumption. A greater focus on *global* food security will inevitably mean a move toward more genuinely global food reserves.

Many studies of food reserves have been done.[83] Although the estimates of 'optimal size' vary widely, depending on the assumed purposes of reserves, and the degree of protection from shortfall desired, all analyses concur on one very important point. Smaller quantities of stored food will provide any given level of security if the reserves operate globally than regionally or nationally. For example, if countries in the Far East chose, individually, to carry enough stocks to cover 95% of their historical fluctuations in grain production, India would need stocks of 13·5 million metric tons, Indonesia 4·4, Thailand 6·2 and Pakistan-Bangladesh 4·2.[84] These five countries would need national stocks amounting to 28·3 million metric tons of grain. But if reserves were held regionally, the entire Far East could achieve the same level of security with stocks of only 12·5 million metric tons. The difference in requirements for regional and global reserves to cover 95% of historical fluctuation are given in Table 11.

If each region undertook to provide reserves to cover its own production fluctuations, almost eight times more grain would be required than if the task were undertaken on a global basis.

These figures suggest that it would be far more efficient to make security against weather-induced production changes a global task. Grain which is in storage as a hedge against future calamity cannot be used to meet present hunger needs. Yet, the right to food which can be erased by a bad year or two is hardly a meaningful one. In the past, it has been argued, North America essentially held reserves for the world as a whole, with the United States

[83] Cf., for example, the United States Department of Agriculture (USDA), Economic Research Service (ERS), *Analyses of Grain Reserves: Proceedings* (Washington D.C.: USDA/ERS, 1976) and Lance Taylor, Alexander Sarris and Phillip Abbott, *Grain Reserves, Emergency Relief and Food Aid* (Washington D.C.: Overseas Development Council, 1977). Both contain excellent bibliographies.

[84] D. Gale Johnson and Daniel Sumner, 'An Optimization Approach to Grain Reserves for Developing Countries', in USDA/ERS, *Proceedings* (f.n. 83). pp. 66–68.

Table 11
Stock levels for regions and globe (1975)
(million metric tons)

Far East	12·5
Latin America	8·5
Near East	8·5
Africa	5·0
Europe	9·5
North America	33·0
Oceania	15·4
USSR	49·0
TOTAL of Regional Requirements	141·4
GLOBAL requirement	18·0

Source: D. Gale Johnson and Daniel Sumner, 'An Optimization Approach to Grain Reserves for Developing Countries', in USDA/ERS, *Analyses of Grain Reserves: A Proceedings* (Washington D.C., August 1976), p. 66.

serving as a 'residual supplier' in case of shortfall. However, a quick glance at Table 11 above indicates that the roughly 8 million metric tons the US presently has in stocks is woefully inadequate for the task.

Present indications are that a global food reserve system, with regularized procedures and multilateral control, is not likely.[85] When supplies are tight or are expected to become so, exporters are reluctant to relinquish control over their stocks. When markets are soft, and are expected to remain so, importing countries are unwilling to subsidize exporting nations' domestic farm policies. Assuming that production continues to vary with weather, the likely outcomes seem clear. Since American reserves will not be able to stabilize global cereal markets as effectively as they have in the past, 'tight' and 'soft' markets will occur.[86] In tight markets, importing countries will scramble for agreements which guarantee their import needs, and will pay the higher prices that will be charged. Countries which are unable to make such agreements or to pay higher prices when they occur will either remain insecure or will develop more localized reserves. In such cases, producers in exporting countries will make financial gains – and perhaps even windfall profits. The domestic consumer reaction to higher prices in these countries, and increasing unwillingness to be subjected to the expense of paying for farm programs in periods of slack, makes it unlikely that major exporting

[85] Cf. Daniel T. Morrow and W. Scott Steele, 'Toward a World Food Reserve System', prepared for the International Studies Association Meetings, February, 1978 (mimeo).
[86] This assumes that the growing unwillingness to finance the agricultural programs which would generate large stocks of surplus grain will continue.

countries will be able to stem the cycles of 'tight' and 'soft' markets. Hence, ad hoc agreements, and localized reserves, will become increasingly important responses to crises of supply.

The analyses which argue that reserves are not cost–effective omit several points.[87] First, they ignore the likelihood that North American stocks will be too small to cover production fluctuations globally. Second, analyses which average 'gains' and 'losses' over time do not take account of the fact that some producers and consumers will not survive to get the 'average' outcome. Producers who cannot afford to absorb several years' losses will lose their farms and their status as producers. Consumers who starve, or who suffer irreversible physical damage, will not recoup these losses in a better year. Third, the analyses do not take into account the fact that certain desirable policies, such as a sustainable right to food, cost far more to protect in times of shortage than do reserves themselves. Finally, in view of the evidence that population growth rates do not fall until economic security rises, long–term costs may be incurred by perpetuating cyclical patterns which prevent the emergence of genuine food security.[88]

If seems clear that a sustainable right to food, however implemented, requires that adequate reserves be held somewhere. Global reserves would place the least strain on physical resources. This does not mean that without them the right to food would be unsupportable. Alternatively, regional, and in many cases national, reserve systems could be created.[89] However, such solutions force an unnecessarily harsh tradeoff between improving present nutrition level and ensuring future consumption. They make a universal right to food harder to achieve, and throw a much heavier burden on national development programs in poor, food–deficit countries than they would otherwise need to bear.

In short, a right to food based on redistributing present global food supplies is physically possible, but attempts to do this can easily go astray within existing global food systems. Direct redistribution through nonmarket channels (such as nutrition–oriented food aid) would make the poor as well as many LDC governments more dependent on the rich.[90] In this

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[87]Cf. Shlomo Reutlinger, David Eaton and David Bigman, 'Should Developing Nations Carry Grain Reserves?', in USDA/ERS, *Proceedings* (f.n. 83), pp. 12–38.

[88]Cf. W. Rich, *Smaller Families Through Social and Economic Progress*, Overseas Development Council Monograph No. 4 (Washington D.C.: ODC, 1973), and James E. Kocher, *Rural Development, Income Distribution and Fertility Decline* (New York: Population Council, 1973).

[89]See Cheryl Christensen and Louis Abuggatus, 'Regional Grain Reserves: An Option for Latin America?', prepared for the National University Conference on Hunger, November, 1975 (mimeo).

[90]For this reason, I am opposed to the idea of creating a centralized, global institution to distribute food to the malnourished. However, for a discussion of how such a Global Food Authority might be established and linked to the right to food, see the testimony of Saul Mendlovitz in hearings on the Right to Food Resolution (f.n. 5).

context, the right to food becomes an imperative to feed people, rather than to remove the obstacles that prevent people from feeding themselves.

Some features of the contemporary global food system act as clear constraints on national efforts to support the right to food. The structure of global food markets is one such constraint. However, attempts to remove these limitations within the present 'rules of the game' are likely to achieve only marginal results. Liberalizing agricultural trade, for example, would be largely ineffective. It would not significantly alter the underlying distribution of wealth which such a structure demands. Measures which change the price that developing countries receive for their agricultural exports would be much more effective. Another clear impediment to a universal right to food is the wide variation in food supply which, because it puts a premium on the ability to pay higher prices in the short term, exacerbates existing inequalities in wealth. Here global action can be much more fruitful, for global food reserves could cope with such fluctuations, using for fewer resources than regional or national reserve programs. In the long run, however, the prospects for achieving a sustainable right to food depend heavily on the choice of development strategy, for changes in the distribution of wealth, both within and among societies, depend ultimately on how production is structured, and who gains from it.

The developmental basis of the right to food

A powerful case can be made for treating the right to food as one of a set of subsistence rights, and embedding the attempts to realize and sustain these rights in a development strategy oriented towards satisfying basic human needs.

There are three main reasons for considering the right to food in the larger context of subsistence rights. First, there are physiological interrelationships which limit the effectiveness of efforts that fulfill only one physical need while bypassing others. Second, a right to food may be more sustainable if it is part of a 'package' of subsistence rights which provides minimal guarantees of economic security. Third, common duties are associated with the provision of all subsistence rights. Violations of one right are likely to generate difficulties with regard to others as well.

It is now generally recognized that improvements in physical health, and even in intellectual capacity, depend on adequate nutrition – especially in a child's formative years. When children are deprived of adequate nutrition, they become more susceptible to a wide range of diseases, develop specific nutritional deficiencies which limit their future physical potential, and in

severe cases undergo irreversible damage to their intellectual development. Malnourished adults have reduced working capacity, greater susceptibility to disease, and in some cases debilitating physical handicaps. In other words, there are enormous personal and societal costs for such deprivation.[91] However, attempts to correct such maladies by improving nutrition are hampered by a vicious circle of related problems. Because infectious diseases reduce the absorption of nutrients, such illnesses automatically diminish the physiological benefits of what should be 'adequate' food supplies.[92] In addition, disease may actually increase the body's nutrient requirements. Polluted water carries parasites, which deplete the body's nutrient supply. In addition, inadequate clothing, especially the lack of shoes, makes the transmission of parasites such as hookworm more likely. Hence, a combination of clean water, minimal health care, and adequate clothing may be necessary to reap the full physical benefits that adequate nutrition should bring.

The interconnections go deeper. Evidence suggests that basic economic security may be a necessary, though perhaps not a sufficient, condition for bringing down the rate of population growth.[93] Simply having enough food is not likely to promote a shift in the timing of the demographic transition. Adequate food, water, shelter, health care and some education, together with perceived guarantees that such gains are secure, are the major components of such an 'economic security' package. Since the sustainability of the right to food may well depend upon slowing down population growth rates, an 'incomplete' security package casts serious doubts on the possibility of sustaining only partial or limited goals.

These two points suggest that there may be practical reasons for considering the right to food as part of a more general class of subsistence rights. In characterizing such rights, Henry Shue states:

> By minimal economic security, or subsistence, I mean healthy air, healthy water, adequate food, adequate clothing and adequate shelter. Many complications about exactly how to specify the boundaries for subsistence would be interesting to explore. But the basic idea is to have available for consumption what is needed for a decent chance at a reasonably healthy and active life of more or less normal length, barring tragic interventions.[94]

These subsistence rights carry with them three classes of subsistence duties:

(1) duties to refrain from eliminating a person's only available means of subsistence (duties to forbear from depriving);

(2) duties to protect people from being deprived by others of their only means of subsistence (duties to protect from deprivation); and

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[91]See N. Scrimshaw, C. Taylor and J. Gordon, *Interactions of Nutrition and Infection* (Geneva: World Health Organization, 1968).
[92]See footnote 89.
[93]Shue (f.n. 6), p. 10.
[94]ibid., p. 21.

(3) duties to provide subsistence for those who are unable to provide for their own (duties to aid the deprived).[95]

Such 'subsistence duties' often cannot be selectively applied to particular aspects of life. For example, depriving a small cultivator of his land or a wage earner of his only source of employment will affect, not only his right to food, but also his opportunity to obtain shelter, to be adequately clothed, and to educate his children.[96] In the context of these subsistence duties, it is clearly self-defeating to ignore actions or processes which erode existing bases of support, and then ask how the victims can be cost-effectively fed. The first imperative is to stop those actions or processes which destroy the ability of people to feed themselves – actions or processes which will generally affect wider subsistence rights as well.

In this concept of subsistence rights and duties, the emphasis lies, *not* on 'feeding' or 'maintaining' people, but on creating a social and economic environment which fosters development and hence need not depend upon charity. To take seriously the notion of subsistence rights and to value them as universally applicable 'minimal reasonable demands' on the rest of society means that the satisfaction of basic human needs must be a primary and explicit focus of development.

There are several reasons for embedding the right to food in a development program oriented towards basic needs. First, if the goal of realizing subsistence rights is paramount, a direct focus on meeting basic needs will generally accomplish this in less time with fewer resources than will more indirect 'trickle-down' approaches. The work of the Bariloche group suggests that there are indeed feasible ways to meet basic needs within the existing resource endowments.[97] Conversely, within a market environment where the structures of unequal distribution of income (and associated distribution of tastes) so demand, it becomes most 'profitable' to meet the needs and wants of the wealthy. The result is that many goods of distinctly secondary importance are produced, despite the serious lack of basic goods which are required for meeting primary human needs. At least with respect to food supplies, attempting to increase the lowest consumption levels without affecting the overall distribution of income would require much higher levels of food production than would a direct assault on hunger.[98]

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[95]For an analysis of the interacting dimensions of subsistence, see G.B. Rodgers, 'A Conceptualization of Poverty in Rural India', *World Development* 4, 4, April, 1976, pp. 261–276.
[96]Herrera (f.n. 18), pp. 83–108.
[97]Cf. Lyle Schertz, 'World Needs: Shall the Hungry Be With Us Always?' in Peter Brown and Henry Shue (eds.), *Food Policy: The Responsibility of the US in the Life and Death Choices* (New York: Free Press, 1977).
[98]Graciela Chichilnisky, 'Economic Development and Efficiency Criteria in the Satisfaction of Basic Needs', *Applied Mathematical Modelling*, 1977.

More generally speaking, there may be a substantial difference, as Chichilnisky shows, between maximizing GNP (computed from prices which reflect underlying demands structures) and utilizing resources to meet basic needs.

Another reason for embedding the right to food in a development strategy oriented to basic needs is that the success of this strategy often depends, not only on agricultural policy, but on the interface between agriculture and industry. An agricultural sector facing severe population pressures cannot be expected to serve indefinitely as a 'labor sink'. Employment must therefore be created through labor–intensive industry. Knowing which agricultural 'strategy' will best support the right to food depends, in part, on being able to see the wider developmental strategy into which the rural sector fits. More is involved in it than the effort to create, however. Decisions concerning what is produced, and for whom, matter enormously.

The difference between simply attempting to generate more employment, and trying to shape production toward meeting basic needs, is illustrated by the model presented in John Mellor's *The New Economics of Growth.*[99] Mellor advocates a rapid commercialization of agriculture, coupled with an industrialization strategy which encourages more labor–intensive production. However, this production is oriented toward meeting the rising demand of upper and middle class rural consumers, and the hopefully increasing demand for labor-intensive exports. Marginal cultivators, small farmers, and the landless rural laborers are all immediately disadvantaged. Heavier commercialization benefits larger farmers, and would likely lead to greater concentration in land holdings, thereby depriving marginal cultivators and some small farmers of their only means of subsistence. The demand for rural labor would decrease as mechanization eliminated traditional agricultural jobs, thus depriving some landless rural workers of their only means of employment; others would face lower wages as the pool of 'surplus labor' increased. Mellor envisions some gains to these groups through lower food prices, the desired consequence of agricultural commercialization. However, the higher costs of imported agricultural inputs, and the implications of adopting a more energy–intensive system of production, make these gains doubtful.

According to the strategy, displaced rural workers would be employed in new, more employment–intensive industries such as textiles, shoes, and processed agricultural commodities. However, such industries, even with expanded export prospects, would not be able to employ sufficient numbers of landless rural workers (40% of the rural population in India, the site of Mellor's study). Hence, rural 'public works' programs would be instituted

[99] John Mellor, *The New Economics of Growth: A Strategy for India and the Developing World* (Ithaca, New York: Cornell University Press, 1976).

as a 'labor sink', despite the fact that such programs are not highly regarded by those who are intended to work in them.[100] Benefits to this group are expected to 'trickle down' as aggregate production grows.

That such a development strategy cannot assure the right to food, nor subsistence rights more generally, is readily apparent. Its immediate effect would be to deprive some workers of their only means of subsistence for the sake of providing greater benefits to others whose subsistence is already assured. Dependence on imports would increase (primarily due to the inputs needed for commercializing agriculture so heavily), and this condition of dependence would in turn divert more resources away from meeting basic needs at home and toward providing goods for consumption abroad. It is perhaps not accidental that the Mellor strategy ignores population growth, for without declining rates of population increase, the 'trickle down' will be hard to achieve. Yet, there is no basis for expecting population control programs to be effective in such an insecure economic environment.

A quite different mix of agricultural and industrial programs is envisioned by a more basic needs oriented approach, based on increasing the productivity of small farmers while creating decentralized, labor–intensive industries. Such attempts to promote more integrated rural development seek to avoid destroying the subsistence base of small farmers before viable alternatives exist. At the same time, the strategy seeks to increase the food supply required to support a larger nonagricultural labor force. The key to this attempt is programs to make yield–increasing inputs (such as fertilizer and improved seed varieties) available to small farmers, along with the capital necessary for land improvement and better water control. Such an emphasis would have an immediate impact on reducing hunger where the subsistence production of small farmers cannot meet basic family food needs.[101] In addition, with improved facilities for local distribution, increased production could serve both to increase the incomes of small famers and to provide more food for nonagricultural laborers.

Such a program would have several other advantages. First, small farms generally achieve higher yields per unit area than larger farms.[102] A strategy oriented toward small farmers may, therefore, be consistent with the desire to obtain maximum production from a given stock of land. Second, studies suggest that small farmers are no worse (and are sometimes better) credit

[100]M. Dantwala, 'A Profile of Poverty and Unemployment in 12 Villages,' *Indian Journal of Agricultural Economics XXX*, 2, May 1977, pp. 245–256.

[101]Cf. Yujiro Hayami and Robert Herdt, 'Market Price Effects of Technological Change in Subsistence Agriculture', *American Journal of Agricultural Economics*, May 1977, pp. 245–256.

[102]For a review of these findings, see Bruce Stoke, *Local Responses to Global Problems: A Key to Meeting Basic Human Needs* Worldwatch Paper 12 (Washington D.C.: Worldwatch Institute, 1978).

risks than large farmers.[103] Third, the 'risk aversion' of small farmers, which may keep them from innovating, is reduced when there are social guarantees that their subsistence production will not be threatened by innovation.[104] Programs to ensure this are possible. They include local or national 'crop insurance' programs – either through conventional insurance schemes, local reserves which can offset the losses of particular farmers in bad years, or more diversified cropping patterns. Also important are commitments not to take the land of farmers who invest in improvements but who then suffer crop failure. The development of local industries which can provide part–time or full–time employment for some members of farm families provides another guarantee against the loss of subsistence in a poor year.[105]

Combining a small–farm strategy with decentralized, labor–intensive local industries is frequently an important key to success. Even with double or triple cropping, the demand for agricultural labor is seasonal. Heavy labor inputs are required for planting and harvesting, yet the full labor force needed during these peak periods cannot be productively employed through slack periods. Local industries which manufacture small–scale agricultural inputs or basic consumer goods can both take up the seasonal slack and release labor for peak requirements.

This labor flexibility is less possible when people travel long distances to work. Because small–scale industries require relatively low capital investments, they are in a position to effectively utilize local savings which are often limited and difficult to mobilize under other conditions.[106] More labor–intensive local projects can also tap investments of 'labor', which are frequently not counted in conventional measures of investment.[107]

The point here is not to advocate any particular basic–needs strategy, but to show the difference which such an orientation makes in laying the foundation for sustainable subsistence rights. The issue is not whether agriculture should be labor–intensive or not, but how agricultural and industrial strategies can be formulated in ways which do not deprive people of their basis of subsistence. Where meeting the bulk of the population's subsistence needs becomes the 'engine of growth', technological adjustments will be

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[103]Uma Lele, *The Design for Rural Development* (Baltimore: Johns Hopkins, 1975), pp. 81–99.
[104]Edgardo Moscardi and Alain de Janvry, 'Attitudes Toward Risk Among Peasants: An Econometric Approach', *American Journal of Agricultural Economics*, November 1977, pp. 710–716.
[105]ibid., the authors find that outside employment is one of the most important factors influencing the willingness to innovate.
[106]See on this topic, the special discussion in the *Indian Journal of Agricultural Economics XXX*, 3, July 1975, pp. 1–82.
[107]For evidence of the undercounting of labor investments, especially of the poor, see Yujiro Hayami *et al.*, *The Economic Accounts of Rural Households in the Philippines* (Los Banos, Philippines: International Rice Research Institute, 1977).

different from what they will be in an economy whose production is geared to satisfying the economic demand generated by a skewed income distribution.

Between dissociation and dependence

The present global food system presents a classic case of what Thomas Nagel terms radical inequality, a situation which

> exists when the bottom level is one of direst need, the top level one of great comfort or even luxury, and the total supply is large enough to raise the bottom above the level of extreme need without bringing significant deprivation to those above – specifically, without reducing most people to a place somewhat above the current bottom. . . .[108]

The fact that such a situation exists should *at least* make us wary of global policies which thrust the burden of achieving the right to food on those countries whose citizens live mostly at the 'bottom level'. It is callous and unjust to argue that it is the responsibility of poor, developing countries with food deficits to single-handedly undertake policies to increase domestic production *simply because* their needs cannot be accommodated by the present global food market. It is both possible and necessary for such countries to improve the level and structure of their domestic food production. However, it is also necessary explicitly to counter the tendency, found in so many studies of the global food situation and related proposals for change, to place the primary responsibility for adjustment on the weakest members of the system.

An important step toward a more equitable distribution of the costs which will inevitably be associated with meeting global food needs is the creation of a shared normative foundation for dealing with these issues. Accepting the idea of a universal right to food, and attempting to apply it in shaping policies, could be a starting point for building such a shared normative foundation. The three classes of subsistence duties could be accepted as the responsibility of national and transnational actors alike and could be used both to help frame global food policies and to restructure national development policies.

The acceptance of common subsistence duties would have several potential benefits. First, it would greatly help to diffuse the unproductive dispute over domestic reform versus international restructuring. Humanitarian lobbies in developed countries often argue that assistance ought to be somehow

[108] Thomas Nagel, 'Poverty and Food: Why Charity is not Enough', in Brown and Shue (f.n. 98), p. 55.

conditional upon assurances that such aid will 'really' benefit those most in need. The conditions imposed, however, tend to boil down to unilateral demands; the donors accept few constraints on their behavior. This is important, for the conditions which some people within donor states seek to impose are often undercut by competing domestic actors, and, frequently, the latter can subvert the beneficial intent of programs more effectively than 'noncomplying' elites in recipient countries. In such an atmosphere, attempts to impose conditions, no matter how humanitarian their intent, cannot fail to provoke charges of hypocrisy and political manipulation. On the other hand, in the absence of guarantees that benefits will flow to the very neediest people, unavoidable suspicions are raised that something other than genuine concern for the poor lies behind demands for greater international equality. Genuinely shared acceptance of even vague, mutually applicable, subsistence duties would help raise the dialogue on world hunger to a different plane.

Second, thinking in concrete terms of *people* can help shift the dialogue away from a focus on 'rich nations' and 'poor nations', a reification which obscures the differences in wealth and power among groups within countries. Subsistence duties of the first class – to forbear from depriving – may apply equally to individuals, organizations and governments. Duties of the second class – to protect from deprivation – must apply to institutions capable of organizing collective action: governments, international organizations, international regulatory bodies, or bodies of appeal. Rarely do deprivations of subsistence occur on a government–to–government basis. Shared norms which reflect this reality would help significantly in formulating policies to cope with such deprivations.

Focusing on the right to food as a subsistence right, with attendant subsistence duties, would also permit the joint consideration of topics now handled separately. Consider, for example, the issue of export commodities. Critics often argue that the present pattern of exporting agricultural commodities from developing countries deprives people within the developing countries of the means to provide for their basic food needs. While this is not always true, it may *sometimes* be the case.[109] Discussions of programs to increase the revenue from such exports often proceed as though these gains were to be distributed among people with unmet subsistence needs, although, again, this is not always the case. With a specific focus on subsistence rights and attendant subsistence duties, however, concerted efforts could be made to adjust commodity prices in ways that would have the greatest impact on basic human needs. For example, attempts to reduce commodity production

[109]This depends heavily on the growth in domestic food production and land concentration and tenure. See Lele (f.n. 106) pp. 22–45.

might be made in situations where such measure *would* release land for the production of staple foods, with the benefits from higher revenues being distributed in ways not directly proportional to the cuts made by specific countries. Developed countries who could foil such attempts to raise export prices (by increasing their own domestic production) might then be persuaded not to do so, knowing that their actions would directly impair the subsistence of specific groups of people.

Similarly, multinational corporations which invest in the production of export crops in developing countries sometimes, though not always, undercut the ability of local people to provide for their subsistence needs. Making clear in which situations their activities are likely to enhance the welfare of people whose subsistence is assured at the expense of the subsistence of others would be an important step in formulating regulatory guidelines for investment consistent with a commitment to subsistence rights. Similarly, identifying those situations in which new capital–intensive agricultural technologies would impair the subsistence of some people, while enriching those whose subsistence is already assured, would permit regulatory guidelines for the introduction of new technology.

Commitment to the first two classes of subsistence duties as global norms would, in turn, enhance the character of the third class of duties – to aid the deprived. Aid, which is limited to providing subsistence for those unable to provide for themselves, would run far less risk of becoming a permanent commitment to feed growing numbers of marginal people. Adhering to the first two classes of duties would provide greater assurance that such assistance would not be permanently treating the symptoms of a deeper, continuing problem. While programs for 'feeding people' may be a necessary part of any genuine commitment to a universal right to food, ideally such efforts should serve as but an adjunct to policies which enable the vast majority of people to 'feed themselves'.

Finally, focusing on a right to food as a shared global norm permits a new perspective on the question of whether or not all countries should attempt to be self–sufficient in basic foodstuffs. The primary reason for advocating national self–sufficiency as a universal policy principle is the conviction that present global food structures make it difficult, if not impossible, to guarantee food 'security' for people with low purchasing power. The 1972–1974 food crisis tends to confirm this view. However, national self–sufficiency which can guarantee the right to food for all citizens will be difficult to achieve quickly. It would be comforting to believe that the burden of complete dissociation would (or could) fall primarily upon the well–fed in developing countries. Unfortunately, this would not be the case in at least the 57 developing market economies in which even totally egalitarian distribution of present food supplies would not provide an adequate diet for

every citizen. Attempting to increase production enough both to eliminate imports and to meet the basic needs of presently hungry people, in the context of already 'programmed' population growth, would mean that a significant number of people would have to remain underfed for a substantial period of time. At least some of the burden of meeting these needs could and should fall on the global community. Thinking of global food reserves as a means of increasing the food security of poorer people could be a step in this direction. The procedures governing the accumulation and release of global reserves should also attempt to fulfill the second class of subsistence duties. Such rules might include provisions for adjusting protective agricultural policies and consumption patterns in industrial economies, when price increases reach a point where they threaten the subsistence of poorer people. They might also include provisions for maintaining the level of food imports in countries where such imports are required to feed the hungry, and at prices consistent with 'non–crisis' import bills.

Although none of these changes would eliminate the need to increase food production in developing countries, they would help to distribute the risks and costs of cyclical 'crises' while such production efforts were taking place. They would not make it 'rational' for developing countries to placidly become more dependent on international food imports, for the cumulative effect of continuing the past import policies could well overwhelm attempts to stabilize global markets.[110] Finally, these changes would make it more feasible to achieve and sustain a right to food in the next decade.

A set of common norms on subsistence rights would eliminate neither the need for fundamental innovations in development strategies and global structures, nor the inevitable conflicts which would accompany the effort toward change. However, the acceptance of such norms would help to focus the processes of national and global change, and would lay a better foundation for genuinely global policies to meet a genuinely global crisis.

[110]International Food Research Policy Institute, *Food Needs of Developing Countries: Projections of Production and Consumption to 1990* (Washington D.C.: IFPRI, 1977).

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